Container and foldable blank for forming the container itself

The invention relates to a container particularly intended to contain products for smokers, or food, confectionary or cosmetic products, and a foldable blank to be used for forming the container itself.

Explicit reference will be made below to containers defining cigarette packets without thereby losing general validity.

Packets for cigarettes are known comprising a front wall and a rear wall having a substantially flat shape, between which two lateral shaped walls are interposed, that are convex in the specific case in relation to the exterior of the packet.

One drawback of these packets is that the convex walls are provided with little stiffness and tend to take on a flat configuration when subjected to squeezing, for example by a user who wishes to access the contents of the packet or in the event of accidental stresses arising from external bodies.

To overcome this drawback, WO 99/02428 teaches how to produce packets of the type disclosed above using flat foldable blanks, in which the side panels intended to form the convex walls of the packet are provided with a plurality of flaps arranged to be folded and then glued respectively in contact with a bottom wall and a top wall of the packet, in such a way as to confer to the latter a certain stability.

The flaps are connected to each side panel along respective straight segments that identify in the finished packet a broken line along which the flaps itselves were folded by 90° to be glued in contact with the bottom wall or with the top wall.

In order that the broken line is acceptably close to the convex contour of the side walls, it is important to provide a large number of flaps of small dimensions, connected to respective side panels along straight segments of the minimum possible length.

One drawback of the prior art disclosed above is that the flaps enable the stiffness of the convex walls to be increased only at the connection zones of these walls with the bottom wall and with the top wall, but are virtually ineffective in the intermediate zones of the convex walls, which can be deformed very easily.

Furthermore, owing to their small dimensions, the above-mentioned flaps create great folding difficulties and above all gluing difficulties in the packaging machines. It is in fact particularly difficult to apply to each flap a sufficient quantity of glue to firmly fix the flap to the bottom wall or top wall without the glue spilling over from the surface of the flap itself, thereby contaminating in an undesired manner parts of the packet and/or diminishing the cleanliness of the packaging machines.

Furthermore, however small the dimensions of the flaps, the broken line along which the flaps are folded is not able to accurately reproduce the convex contour of the side walls of the packet and is therefore responsible for faults in the connection zone between the convex wall and respectively the bottom wall or the top wall.

One object of the invention is to improve the containers provided with shaped walls that protrude towards the exterior of the container and particularly to increase the stiffness of the above-mentioned shaped walls.

A further object is to simplify the production of the containers provided with shaped walls, particularly by facilitating folding and gluing operations in the packaging machines.

Another object is to eliminate the prior-art drawbacks that are due to the flaps connected to the side panels that have to be folded and glued into contact with the bottom wall or with the top wall.

In a first aspect of the invention, a container delimited by wall means is provided comprising shaped wall means that protrudes towards the exterior of said container, said container comprising stiffening means arranged to stiffen said shaped wall means, characterised in that said stiffening means comprises stiffening wall means distanced from said shaped wall means.

Owing to the stiffening wall means, it is possible to obtain a container provided with shaped wall means provided with relatively high stability, even when subject to squeezing by a user or to accidental mechanical stresses due to external bodies.

The stiffening wall means furthermore enables the flaps of the prior art to be eliminated, thereby simplifying container packaging operations, and particularly the difficulties of folding and gluing the known flaps are overcome.

In a second aspect of the invention, a foldable blank is provided for forming a container, comprising a first greater panel, a second greater panel, longitudinal panel means that extends parallel to said first greater panel, a longitudinal strip that has a longitudinal side in common with said longitudinal panel means, characterised in that said longitudinal panel means is subdivided into a first zone that has a side in common with said first greater panel, and a second zone that has a side in common with said longitudinal strip.

The foldable blank according to this aspect of the invention enables a container to be obtained that is provided with shaped wall means formed starting at the first zone of the longitudinal panel means and with stiffening wall means formed starting at the second zone of the longitudinal panel means. The second zone of the longitudinal panel means replaces the flaps of known foldable blanks and therefore enable the stiffness of the shaped wall means to be increased, thereby

simultaneously overcoming the drawbacks connected with the presence of the flaps.

The invention will be better understood and implemented with reference to the attached drawings, which illustrate some embodiments by way of non-limiting example, in which:

Figure 1 is a perspective view of a container according to the first aspect of the invention;

Figure 2 is a plan view of a foldable blank suitable for forming the container in Figure 1;

Figure 3 is a schematic section of the container in Figure 1 taken along a plane at right angles to the axis Z; and

Figures 4 to 7 are schematic sections like the one in Figure 3 showing some alternative embodiments of the container in Figure 1.

Figures 1 and 3 show a container according to the first aspect of the invention, particularly a stiff packet 1 containing products for smokers, such as for example cigarettes 9.

The packet 1 extends mainly along a longitudinal axis Z and comprises a containing body 2 closed at the top by a lid 3 hinged on the containing body 2. The lid 3 is rotationally movable between a closed position, shown in Figure 1, and an open position that is not shown in which a user can access the products arranged inside the packet 1.

The above-mentioned packet is delimited by a front wall 4 and by a rear wall 5 parallel to one another and to the longitudinal axis Z, and by a pair of side walls 6 facing each other, connected to the front wall 4 along a pair of front longitudinal edges 11 and to the rear wall 5 along a pair of rear longitudinal edges 12. A bottom wall 7 and a top wall 8 are also provided that are parallel to one another and delimit the packet 1 perpendicularly to the longitudinal axis Z.

As shown in Figure 3, the side walls 6 are convex towards the exterior of the packet 1 and comprise a portion of cylindrical

surface passing through the respective longitudinal front edge 11 and longitudinal rear edge 12.

With the side walls 6 stiffening walls 10 are furthermore associated that are arranged to make the deformation of the side walls 6 more difficult if the packet 1 is subject to external mechanical stresses. As each stiffening wall 10 has a substantially flat geometry, it extends between a front longitudinal edge 11 and the rear longitudinal edge 12 adjacent thereto, the stiffening wall 10 being provided with an extent W in the direction of the thickness of the packet 1 substantially equal to the internal thickness of the packet.

The stiffening walls 10 are furthermore connected near the rear longitudinal edges 12 with respective anchoring walls 13 that rest on the rear wall 5 and are fixed to it, for example by gluing.

The anchoring walls 13 enable the stiffness conferred to the side walls 6 by the stiffening walls 10 to be further increased, thereby ensuring that the latter do not move when the packet 1 is subjected to mechanical stresses.

The stiffening walls 10, thus like the anchoring walls 13, extend substantially along the entire extent of the packet in the direction of the longitudinal axis Z. This enables stability to be conferred to the side walls 6 along their entire length and not only at the connection zones with the top wall 8 and with the bottom wall 7, as occurred with the flaps of the prior art.

Furthermore, owing to the considerable extent of the anchoring walls 13, if they are compared with the flaps of the prior art, it is easy to understand how the glue can be applied to the anchoring walls relatively easily without spilling over.

It should be noted that the stiffening walls 10 identify, together with the front wall 4 and the rear wall 5, an empty space having a substantially parallelepiped shape inside the

packet 1. The shape of this empty space substantially corresponds to the shape of a composition of cigarettes to be introduced inside the packet 1, which enables any play between the cigarettes 9 and the packet 1 to be avoided that could cause the cigarettes 9 to get damaged.

Furthermore, inside the empty space a collar of traditional type that is not shown can be inserted.

Figure 2 shows an example of a foldable blank 14 that can be used to form the packet 1. The foldable blank 14 is for example a flat die-cut blank in cardboard that may be printed.

The foldable blank 14 mainly extends along an axis of symmetry Z1 and is shown in Figure 2 by a symbology that is usually used in the papermaking industry, and which provides for indicating the cutting lines through continuous lines and the creasing lines through broken lines.

The foldable blank 14 comprises a first greater panel 17 that extends along the axis of symmetry Z1 and is interposed between a first transverse panel 16 and a second transverse panel 18. The first transverse panel 16 is in turn connected to a second greater panel 15, whereas the second transverse panel 18 has a side in common with a smaller panel 19 from which a reinforcing flap 20 extends. The panels are connected together along transverse creases 21 that are arranged perpendicularly to the axis of symmetry Z1.

The first greater panel 17, the first transverse panel 16 and the second transverse panel 18 are arranged to form in the packet 1, respectively the rear wall 5, the bottom wall 7 and the top wall 8. The second greater panel 15 and the lesser panel 19 are on the other hand intended to form the front wall 4. The reinforcing flap 20 is arranged to be folded by 180° around the respective transverse crease 21 and glued to the lesser panel 19, to allow repeated openings of the lid 3 without damage to its front portion.

The first greater panel 17 is furthermore adjacent to longitudinal panel means 45 arranged on opposite sides of the axis of symmetry Z1. Each longitudinal panel means 45 comprises a first zone 22 connected to the first greater panel 17 along a respective longitudinal border 44, and a second zone 24 adjacent to a respective longitudinal strip 26.

The first zone 22 and the second zone 24 are adjacent to one another along a first longitudinal crease 23 parallel to the axis of symmetry Z1. These zones 22 and 24 extend along the axis of symmetry Z1 substantially by the same length, this length corresponding to the length of the greater panel 17 along the axis of symmetry Z1.

Each first zone 22 is provided with a transverse extent W1 that is greater than a further transverse extent W2 of the second zone 24. Furthermore, the further transverse extent W2 of the second zone 24 substantially corresponds to dimension H of the first transverse panel 16 and of the second transverse panel 18 in the direction of the axis of symmetry Z1.

The longitudinal strips 26 are connected to the second zone 24 of the longitudinal panel means 45 along second longitudinal creases 25 parallel to the axis of symmetry Z1. Such strips are trapezium-shaped, being delimited transversely to the axis of symmetry Z1, by segments 27 converging towards the exterior of the foldable blank 14. In this way, the length L1 of each longitudinal strip 26, measured in the direction of the axis of symmetry Z1 from the external part of the foldable blank 14, is slightly less than the length L2 of the respective second longitudinal crease 25. This enables interference between the longitudinal strips 26 and the first transverse panel 16 or the second transverse panel 18 to be avoided both during folding operations of the foldable blank 14 and in the finished packet 1.

On both sides of the second greater panel 15 and of the lesser panel 19 first external panels 28 and second external panels 29 are respectively provided.

In the packet 1, the first external panels 28 and the second external panels 29 are externally superimposed on the first zones 22 of the longitudinal panel means 45 and are glued to them to form the side walls 6. The first external panels 28, the second external panels 29 and the first zones 22 of the longitudinal panel means 45 are provided with a plurality of longitudinal creases 30 that enable the panels 28 and 29 and the zones 22 to take on an arched configuration corresponding to the curved borders 31 that laterally delimit the first transverse panel 16 and the second transverse panel 18, in such a way as to create in the packet 1 concave side walls 6 of the type shown in Figure 3.

During packaging of the packet 1, the second zones 24 of the longitudinal panel means 45 are folded inside the first zones 22 in such a way as to extend between a front longitudinal edge 11 and the corresponding rear longitudinal edge 12. The longitudinal strips 26 are folded 90° in relation to the second zones 24, until they come to rest against the first greater panel 17 that forms the rear wall 5, and are subsequently glued into contact with the panel. In this way the configuration shown in Figure 3 can be obtained.

On the first greater panel 17 a hinge crease 32 is furthermore provided that is perpendicular to the axis of symmetry Z1, which in the finished packet 1 forms a hinge around which the lid 3 can be rotated to access the cigarettes 9.

From the two sides of the hinge crease 32 located on opposite sides in relation to the axis of symmetry Z1 respective tilted cutting lines 33 depart that extend through the first zones 22 in a tilted direction to the first transverse panel 16 and terminate on the first longitudinal creases 23 at respective points P. From these points further tilted cutting lines 34

extend that cross the second zones 24 in a direction tilted towards the second transverse panel 18. The tilted cutting lines 33 and the further tilted cutting lines 34 are specular to one another in relation to the respective first longitudinal creases 23. The further tilted cutting lines 34 terminate on the second longitudinal creases 25 at the further points Q from which horizontal cutting lines 35 extend that are arranged transversely to the longitudinal strips 26.

Along the tilted cutting lines 33 and the further tilted cutting lines 34 joints 36 are provided that facilitate the handling of the foldable blank 14.

In the finished packet 1, the horizontal cutting lines 35 of the longitudinal strips 26 are arranged along the rear wall 5 near the hinge line 32 and enable the lid 3 to be opened and/or closed without additional effort compared with the effort required to overcome the resistance of the hinge line 32. The tilted cutting lines 33 and the further tilted cutting lines 34, after being placed side by side during packaging of the packet, form the tilted borders 37 of the lid 3. The user opening the packet 1 for the first time breaks the joints 36 to access the cigarettes 9 housed in the containing body 2.

Figures from 4 to 7 show some alternative embodiments of the container according to the invention.

The container shown in figure 4 is delimited not only by the front wall 4 and by the rear wall 5 that are parallel to each other and are substantially flat but also by a pair of side walls 6a each one of which comprises a semicylindrical portion the axis of which passes through point C arranged about half way along the stiffening wall 10.

This container can be obtained by starting with a foldable blank like the one in Figure 2, in which the first zones 22, the first external panels 28 and the second external panels 29 each have a transverse extent W1 that is approximately 3.14/2 times the further transverse extent W2 of each second zone 24.

Figure 5 shows a container whose side walls 6b comprise a pair of first side walls 38 adjacent to the front wall 4 and a pair of second side walls 39 adjacent to the rear wall 5 in such a way as to define a prism having a transverse section like an irregular hexagon. The first side walls 38 and the second side walls 39 have a substantially flat shape.

The container in Figure 5 can be obtained from a foldable blank similar to the one in Figure 2, in which the plurality of creases 30 of the first zones 22 of the first side panels 28 and of the second side panels 29 is replaced by a single intermediate crease parallel to the axis of symmetry Z1 and equidistant from the longitudinal borders of the side panels and of the second zones.

Figure 6 shows an embodiment of a container provided with side walls 6c comprising a substantially flat intermediate portion 40 connected to the front wall 4 and to the rear wall 5 by peripheral portions 41 provided with a curved geometry. The peripheral portions 41 may for example have a transverse section like a circumference arch. The container in Figure 6 can be obtained starting from a foldable blank like the one in Figure 2, in which the first zones 22, the first external panels 28 and the second external panels 29 are provided with a central region without creases and with two bundles of multiple creases arranged at the borders of the central region in such a way as to form curved peripheral portions 41 in the finished container.

Lastly, in the embodiment in figure 7, side walls 6d are provided, each one of which comprises a first convex portion 42 that has a convex-shaped transverse section, the convexity of which is turned towards the inside of the container, and a second portion 43, provided in a cross-section with a concave shape, the concavity of which is turned towards the inside of the container. The first portion 42 may for example be

adjacent to the front wall 4 whereas the second portion 43 is adjacent to the rear wall 5.

All the embodiments of the figures from 3 to 7 comprise stiffening walls 10 designed to prevent or at least reduce the deformation of the side walls 6, 6a, 6b, 6c, 6d and connected to anchoring walls 13 folded in contact with the rear wall 5 and that are made integral with it by means of gluing.

The anchoring walls and the stiffening walls may be provided not only in the case of containers provided with side walls having one of the shapes indicated in Figures 3 to 7 but in general in the case of containers provided with one or more formed walls protruding towards the exterior of the container, which would tend to become deformed, for example taking on a flat configuration, when subject to squeezing or other external mechanical stress.